

REMARKS

This Amendment, submitted in response to the non-final Office Action dated May 17, 2005, is believed to be fully responsive to the points of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

Claims 15-22 and 28 are pending. Claims 23, 24 and 29 are cancelled above. Claims 15-18, 21 and 22 are amended above. No new matter is added by the amendments.

The Examiner objected to the use of the terms "high voltage" and "high current" in claims 17 and 22 as being relative terms that render the claims indefinite. Applicants have amended Claims 17, 21 and 22 and respectfully request that the objections be withdrawn.

Claims 15-20 and 24 have been rejected under 35 USC 103(a) over published US Patent Application No. 2003/0193987 (Zalameda), in view of published US patent Application No. 20020180384/US Patent No. 6,583,588 (Erhardt). Claim 23 has been rejected under 35 USC 103(a) over Zalameda, in view of Erhardt, in further view of US Patent No. 6,127,666 (Sohn). Claim 29 has been rejected under 35 USC 103(a) over Zalameda, in view of Erhardt, in further view of US Patent No. 6,630,996 (Kinney). Claims 15, 24 and 29 have been rejected under 35 USC 103(a) over Zalameda, in view of US Patent No. 6,759,793 (Narita). Claims 21, 22 and 28 have been rejected under 35 USC 103(a) over Zalameda, in view of Erhardt, in further view of Integrated Gate-Commutated Thyristors (Caroll).

Applicants respectfully submit the following remarks in support of the patentability of the claims.

1. Claims 15-20:

Claims 15-20 have been rejected under 35 USC 103(a) over Zalameda, in view of Erhardt. Claim 15 has been amended to clarify that the at least one lamp is a flash lamp and that the at least one active quenching means controls a duration of a flash. Amended Claim 15 is directed to an infrared ("IR") thermography imaging system including at least one flash lamp configured to heat a surface of an object to be imaged and at least one active quenching means configured to quench the at least one flash lamp to control a duration of a flash. The active quenching means is configured to receive a control signal

T2 and to quench the flash lamp in response to the control signal T2. An IR camera is configured to capture a number of IR image frames of the object.

As discussed in paragraph 25 on page 6 of the present application:

The decay time constant T of the lamp 12 is typically characterized by a resistance R and a power supply capacitance C . The time constant T governs the decay time for a flash. As shown in FIG. 2 by the dashed line, without quenching, the flash has an exponential tail. This exponential tail would continue to heat the object during data acquisition, thereby distorting the thermal information in the data frames. A quenched flash is shown by the solid line.

Thus, quenching serves to control a duration of the flash.

In contrast, Zalameda uses unquenched lamps and instead provides a synchronized electronic shutter system for covering the lamps and detector. (Abstract). Zalameda does not teach or suggest actively quenching a lamp to control a duration of a flash. Rather, Zalameda uses the shutter system to cover the lamps and detector. See, for example, the following discussion from the Summary on page 1 of Zalameda:

After actuation of the flash heat lamp(s), the shutter(s) on the flash heat lamp(s) is/are closed to cover the flash heat lamp(s) at the same time the shutter to the infrared detector is opened to start thermal data acquisition over a period of time while the object under test cools down. Because the shutter(s) to the flash heat lamp(s) now cover the flash heat lamps, residual transient effects originating from a recently fired flash heat lamp(s) do not reach the infrared detector and thus do not effect the data being acquired.

As is further explained in paragraph 40 on page 3 of Zalameda:

Another concern of a single-sided thermal inspection system besides flash heating is the residual effect of the flash lamps. ... the lamps, being recently fired, are hot and emit infrared radiation that is reflected off the sample under test. This reflected radiation superimposes with infrared radiation emanating from the sample under test back into the infrared detector and gives erroneous results. This afterglow phenomenon is illustrated in FIGS. 3A and 3B. ... The resultant temperature image (i.e., having a duration of 0.03 seconds) at a point in time sometime shortly after the firing of the flash lamps is illustrated in the temperature image 30 of FIG. 3A having residual lamp reflections 32.

Applicants agree with the Examiner that the lamps in Zalameda are powered on and off. However, the lamps in Zalameda are not actively quenched to control a duration of a flash, as recited by Claim 15. Instead, Zalameda uses a shutter system to cover the

lamps. This rapid shutter system is the subject of the invention of Zalameda. Accordingly, Applicants respectfully submit that Zalameda teaches away from the present invention, in that Zalameda shutters the lamps instead of actively quenching the lamps to control a duration of the flash.

The Examiner cites Erhardt to supply the active quenching means recitation. However, Erhardt is directed to a system for automatically turning off high intensity discharge (HID) lamps that need to be turned off at least once per week to maintain proper operation (Background in Col. 1). The automatic cycling control of Erhardt insures that lamps are cycled at least once per week. (Col. 2, lines 11-15). Erhardt does not teach or suggest at least one active quenching means configured to quench at least one lamp to control a duration of a flash, wherein the active quenching means is configured to receive a control signal T2 and to quench the lamp in response to the control signal T2, as recited by Claim 15. Rather, the switching device 54 of Erhardt turns an HID lamp off and on. The HID lamp does not flash, and Erhardt thus does not provide an active quenching means for controlling a duration of a flash.

Furthermore, the Examiner's arguments to combine the two references on page 3 of the Office Action neglect the different types of lamps used in the two references (flash lamps in Zalameda and HID lamps in Erhardt) as well as their different time scales (the HID lamps are cycled off once every 168 hours and cooled for about fifteen minutes in Erhardt, as compared to the flash lamps in Zalameda, which are fired and have a typical duration of about 0.008 seconds (See, for example, Col. 4, lines 44 and 52-53 of Erhardt and page 1, middle of Par. 5 of Zalameda.) The need to cool the HID lamps of Erhardt is thus not present for the flash lamps of Zalameda.

In view of the above, Applicants respectfully submit that Claim 15 is patentably distinguishable over the Zalameda and Erhardt, either alone or in combination. Further, as claims 16-20 depend from Claim 15, these claims are also patentably distinguishable over the cited art, for at least the reasons presented above with respect to Claim 15. Accordingly, Applicants respectfully request that the rejections of Claims 15-20 under 35 USC 103(a) be withdrawn.

2. Claim 15:

Claim 15 has been rejected under 35 USC 103(a) over Zalameda, in view of Narita.

The Examiner cites Zalameda as disclosing an active quenching means. However, Zalameda does not employ at least one active quenching means configured to quench at

least one flash lamp to control a duration of a flash, as recited by Claim 15. Rather, Zalameda shuts the lamp. The shutters do not quench the lamp. Instead, the shutters block radiation from the lamp.

Narita is directed to a lamp unit for a projector and does not teach or suggest at least one active quenching means configured to quench at least one flash lamp to control a duration of a flash, as recited by Claim 15. Instead, the Examiner has pointed to a cooling means 50 and a means 60 for changing the power of a mercury lamp.

In view of the above, Applicants respectfully submit that Claim 15 is patentably distinguishable over the cited art and request that the rejection of Claim 15 under 35 USC 103(a) over Zalameda, in view of Narita be withdrawn.

3. Claims 21, 22 and 28:

Claims 21, 22 and 28 have been rejected under 35 USC 103(a) over Zalameda, in view of Erhardt, in further view of Integrated Gate-Commutated Thyristors (Caroll).

Claims 21, 22 and 28 depend from Claim 15. As discussed above in Section 1, Zalameda and Erhardt do not disclose the active quenching means of Claim 15. The Examiner has cited Carroll for teachings regarding power semiconductor switches. However, Carroll does not supply the above-discussed deficiencies of Zalameda and Erhardt.

Accordingly, Applicants respectfully submit that Claims 21, 22 and 28 are patentably distinguishable over the cited art and respectfully request that the rejections of Claims 21, 22 and 28 under 35 USC 103(a) be withdrawn.

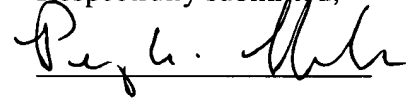
In view of the above, Applicants respectfully submit that Claims 15-22 and 28 are in condition for allowance.

In view of the foregoing, Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are respectfully requested.

Please charge all applicable fees associated with the submittal of this Amendment and any other fees applicable to this application to the Assignee's Deposit Account No. 07-0868.

Should the Examiner believe that anything further is needed to place the application in even better condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number below.

Respectfully submitted,



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